UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2024/25
MASTER DEGREE
AGRICULTURAL SCIENCES FOR SUSTAINABILITY (Classe LM-69)
Enrolled from 2022/23 academic year

HEADING

Degree classification - Denomination and code:	LM-69 Agricolture
Degree title:	Dottore Magistrale
Length of course:	2 years
Credits required for admission:	180
Total number of credits required to complete programme:	120
Years of course currently available:	1st , 2nd
Access procedures:	Open, subject to entry requirements
Course code:	G66

PERSONS/ROLES

Head of Study Programme

Prof. Roberto Oberti

Tutors - Faculty

Tutor per i piani di studio:
A-B Prof. Aldo Calcante
C Prof.ssa Arianna Facchi
D-E-F Prof. Pietro Marino Gallina
G-H-I-K-L Prof.ssa Alessia Perego
M-N-O Prof. Giorgio Ragaglini
P-S Prof. Luca Rapetti
T-Z Prof.ssa Maddalena Enrica Zucali

Degree Course website

https://sas.cdl.unimi.it/it

Course management for the Faculty of Agricultural and Food Sciences (Science and Technology area)

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Student registrar

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CHARACTERISTICS OF DEGREE PROGRAMME

General and specific learning objectives

The MSc degree course in Agricultural Sciences for Sustainability (belonging to the class of graduate courses in Agricultural Sciences and Technologies-LM-69), aims to prepare master?s graduates responding to the profile of the modern agronomist: a professional figure with firm technical culture and a broad multidisciplinary vision of the agricultural system.

The learning program is primarily characterized by technical contents, based on the operational transfer of the most recent scientific acquisitions and on the applications of technological innovations in the area of agriculture.

The highly multidisciplinary learning program ensures the graduates gain a wide cultural and scientific vision and technical adaptability, along with a deep awareness of the function of modern agriculture ? which, in its most recent evolution, added to the original aim of producing food ? as well as the objectives of preserving the territory, guaranteeing the safety of products and protection of the environment.

Graduates acquire a multidisciplinary and integrated vision of problems that have to be faced in order to plan and manage the continuous adaptations of the agricultural production system to the new needs required by complex and advanced society.

Relying on firm multidisciplinary basis mostly related to the activities of the 1st year, students will acquire a well characterized specialistic profile through the 2nd year courses, and trough their thesis work that will be developed on a subject in the area of the specialization track chosen.
In order to graduate professionals ready to seize job opportunities offered by the most advanced scenarios of European agriculture, the master?s degree program offers three tracks of specialization:
- farm management track, focused on the planning and management of agricultural production processes, the relations with the markets, the services for the farm and the supply chain of technical means, the distribution and transformation of raw products, and the economic-regulatory framework of farm activities;
- animal systems track, focused on breeding, the processes and technologies of the livestock farm, the management of quality, safety and sustainability of animal production, and the relations with the food supply chains;
- precision agriculture track, focused on site-specific crop management methods aimed to optimize and maximize the efficiency of production processes, automation technologies and digital farming, modelling to optimize the use of inputs, and the planning of production processes.
The students can also compose their own personalized specialization track according to their professional interests. Proposals of personalized specialization tracks are subject to the approval of the Collegio didattico board according to their consistence with the goals of the master's degree course.

Expected learning outcomes

Graduates in Agricultural Sciences for Sustainability are experts in planning and management of agricultural production processes in crop and livestock farms, their long-term sustainability and their links with agri-food markets and regulatory context.
Depending on the specialization track chosen, students will gain knowledge and capabilities to:
- define and plan the production process and appropriate management techniques for the major crop and livestock productions;
- select and apply management techniques, modelling tools and field technologies to enhance the quality and yield of products, adapting the farming choices to the specific conditions of the production and market trends by respecting regulations and specific production protocols;
- apply criteria and tools to evaluate, manage and plan the economic and administrative aspects of the production activities of farms and to understand market trends, agri-food trade policies and the implications on market opportunities;
- define the needs of technical means and technologies for agriculture and related services, and to know the operation and organization of field and farming technical assistance in detail;
- use instrumentation, measurement techniques and estimation criteria for sizing and designing plants, structures and systems, to improve farm activities and for the enhancement of production;
- know how to select machines and systems suitable for different farming conditions and be able to evaluate the technical-economic aspects related to their use in field and livestock production, in the handling, storage and initial transformation of products;
- choose techniques and technological innovations to improve the environmental sustainability of plant and animal productions, applying criteria for assessing their environmental impact;
- use agronomic, hydrological and physiological modelling tools for site-specific identification of limiting factors or detecting stress conditions and to optimize the use of production inputs;
- know remote sensing and proximal sensing technologies and their use at different spatio-temporal scales and know how to analyse and understand data for estimating the main parameters of the crop;
- manage the different production factors and feed formulation for the purposes of quality, safety and economic and environmental sustainability of livestock production;
- operate with a high degree of autonomy, taking the responsibility of project tasks or coordinating functions;
- be fluent in written and oral English, with specific knowledge of the technical vocabulary.

Professional profile and employment opportunities

Graduates in Agricultural Sciences for Sustainability are trained to take management roles in coordinating and planning production processes in crop and livestock farming, in the agri-food market chains and in the industry, private services and public bodies operating with the agricultural production sector.
The skills acquired by graduates in Agricultural Sciences for Sustainability therefore allow them to carry out entrepreneurial roles, managerial responsibilities, planning, consultancy and operational management in the following areas/sectors:
- technical and economic management of production processes in crop and livestock farms and in the related supply-chains;
- field and animal breeding technical assistance;
- companies or industries of technical means (seeds, fertilizers, crop protection products, feed, etc.) and of machinery, plants, structures, technologies and services for agriculture;
- agri-food chains for the distribution and processing of agricultural products, and produce marketing;
- administrative, regulatory, technical and economic consultancy professional services for agricultural business;
- digital and ICT technology companies for agriculture and precision farming;
- public bodies operating with agricultural activities and resources.
In particular, graduates in Agricultural Sciences for Sustainability may have the following career opportunities related to the chosen specialisation track:
- farm management track: management functions of direction and coordination in farms, agricultural enterprises and agri-food distribution and processing chain, in the agricultural sector of public bodies, professional consultancy, technical and commercial assistance services to companies and industries operating with agriculture;

- animal systems track: management functions of direction and coordination in livestock farms and animal product distribution and processing chain, technical and commercial assistance professional consultancy in livestock production and R&D in agriculture technologies companies;
- precision Agriculture track: technical or professional services to support agricultural production, ICT companies for agriculture (IT, modeling, remote sensing, etc.), innovation start-ups for the agri-food system, R&D in technology and agricultural machinery industry, and technical and commercial assistance services for farms.

Initial knowledge required

Admission requirements

Graduates in class L-25 (Agricultural sciences and technologies), as well as in the corresponding class pursuant to Ministerial Decree 509/99, may access the programme if they have earned at least 30 credits in the following academic fields:
FIS/01 to FIS/07
MAT/01 to MAT/09
INF/01 - Computer science
SECS-S/01 - Statistics
CHIM/03 - General and inorganic chemistry
CHIM/06 - Organic chemistry
BIO/01 - General botany
BIO/02 - Systematic botany
BIO/03 - Environmental and applied botany
BIO/04 - Plant physiology
BIO/05 - Zoology
BIO/13 - Applied biology
Graduates from classes other than class L-25, who, in addition to 30 credits in the aforementioned academic fields, have earned at least 60 credits in the following academic fields, may also access the programme:
AGR/01 - Economy and rural appraisal
AGR/02 - Agronomy and herbaceous crops
AGR/03 - General arboriculture
AGR/04 - Horticulture and floriculture
AGR/07 - Agricultural genetics
AGR/08 - Agricultural hydraulics
AGR/09 - Agricultural mechanics
AGR/10 - Rural constructions and agro-forestry territory
AGR/11 - General and applied entomology
AGR/12 - Plant pathology
AGR/13 - Agricultural chemistry
AGR/15 - Food science and technology
AGR/16 - Agricultural microbiology
AGR/17 - General zootechnics and genetic improvement
AGR/18 - Animal nutrition and feeding
AGR/19 - Special zootechnics
AGR/20 - Zooculture
ICAR/06 - Topography and cartography
ICAR/15 - Landscape architecture
IUS/03 - Agricultural law
IUS/14 - European Union law
SECS-P/08 - Economics and business management
VET/01 - Anatomy of domestic animals
VET/02 - Veterinary physiology

Applicants must have proficiency in English at level B1 or higher in the Common European Framework of Reference for Languages (CEFR). Verification of level B1 proficiency can be achieved through one of the following methods:
-Validation of knowledge by the UniMI Language Center (SLAM), with recognition of level B1 or higher.
-Validation of knowledge by another Italian University, with transcription of level B1 or higher in the certificate of exams taken during a previous degree course.
-Linguistic certification of level B1 or higher recognized by the University (Refer to Recognized Language Certifications on the University of Milan Statale website).
-Passport certifying Anglophone nationality.
-Holding a degree from Anglophone universities.

Admission assessment

For the candidate evaluation, an examining committee will assess candidates' curricular requirements and the adequacy of

their initial preparation through specific interviews. These interviews will be conducted remotely on a monthly basis from June to December. Candidates will receive instructions on the remote connection at least 10 days before their convocation. Interviewees must have filled beforehand any educational gaps through special interviews with faculty members teaching those subjects, who will be appointed by the chair of board.
Graduates of the University of Milan (UNIMI) in "Agricultural Sciences and Technologies", "Agricultural Technology for the Environment" and "Improvement and Protection of Mountain Environment" are admitted by right to the Master's degree programme in Agricultural Sciences and are therefore waived from the admission interview requirement.
UNIMI graduates in "Management of Cultivated Plants and Landscaping" must prove adequate knowledge of zootechnics to be admitted, while UNIMI graduates in "Viticulture and Enology" must prove adequate knowledge of livestock and herbaceous crops.
All other candidates, both from this and other universities, will be required to self-certify their previous academic record to the chair of the board (roberto.oberti@unimi.it and didattica.disaa@unimi.it), when submitting their application. The board will thus be able to identify any gaps and the required interviews with specific faculty members.
Those who fail to meet admission requirements by sitting interviews, as required by the chair of the board, will not be admitted to the programme.
Candidates who meet entry requirements will be admitted to the programme without having to sit any interviews.

Compulsory attendance

Attendance is strongly recommended.

Degree programme final exams

Upcoming graduates must pass a final exam (24 CFU) by presenting and defending an original paper written by the student under the guidance of a supervisor and possibly a co-supervisor. The Master's degree thesis is an essay structured as a scientific publication. For students to be admitted to the final exam, they must have completed their thesis and earned 96 credits, including 3 credits for "Additional skills". Moreover, they must prove English language proficiency at a B2 level or higher under the Common European Framework of Reference for Languages (CEFR).

Notes

To obtain the final degree, proficiency in English at level B2 is required. This level can be certified in the following ways:

1. A language certification obtained no more than 3 years before the date of submission, at level B2 or higher, must be uploaded to the portal [http://studente.unimi.it/uploadCertificazioniLingue] (http://studente.unimi.it/uploadCertificazioniLingue). Refer to the list of language certifications recognized by the University on the website: https://www.unimi.it/it/node/297/.
2. Obtaining an English level B2 or higher during a degree course at Unimi through the University Language Center SLAM, including certifications validated during the three-year degree course. Assessments obtained within four years from the date of application are considered valid. Verification is automatic without the need to attach certificates.
3. A Placement Test administered by SLAM exclusively during the first year, from October to January. Those who do not achieve level B2 or higher must attend an English course at level B2, provided exclusively by the University Language Center SLAM in the second semester of the first year. Those who do not attend the course or do not pass the final test within 6 attempts must obtain an external B2 language certification before graduation.

EXPERIENCE OF STUDY ABROAD AS PART OF THE TRAINING PROGRAM

The University of Milan supports international mobility by providing its students with the opportunity to spend study and internship periods abroad. It is a unique chance to enrich your educational path in a new exciting environment.
The agreements entered into by the University with over 300 universities from the 27 EU member countries under the European Erasmus+ programme allow regularly enrolled students to carry out part of their studies at one of the partner universities or to undertake internships at companies, training and research centres and other organizations. Similar international mobility opportunities are provided outside Europe, through agreements with a number of prestigious institutions.

Study and internships abroad

The Course of study in Agricultural Sciences gives many opportunities for stages abroad mainly through the Erasmus+ programme. About 30 foreign Universities of the EU are involved in this students exchange. The areas of study which can be followed by the students abroad are almost all those included in this course of study. In general, students who make a stage abroad attend local courses or participate in research for the preparation of their thesis. The learning agreement is outlined in collaboration with the person in charge for the Erasmus of the degree program, as regards both the choice of courses and the organization of the internship at the partner university. Students must obtain the formal approval of the examinations that they intend to carry out at the host university from professors who hold equivalent or similar teachings at the University of Milan before completing the learning agreement. As regards experimental activities abroad, which can constitute part or the entire program of the internship, a letter of agreement from a professor of the partner university is required, along with the formal approval on the objectives, on the program and on the term of the internship by a professor of the degree program, who will also act as supervisor. Other possibilities exist in terms of cultural exchange with non EU universities (in China, Japan, Latin America) not involved in the Erasmus programme.

How to participate in Erasmus mobility programs

The students of the University of Milan can participate in mobility programmes, through a public selection procedure.
Ad hoc commissions will evaluate:
Academic career
the candidate's proposed study programme abroad
his/her foreign language proficiency
the reasons behind his/her application

Call for applications and informative meetings
The public selection for Erasmus+ mobility for study generally begins around February each year with the publication of a call for applications specifying destinations and requirements. Regarding the Erasmus+ Mobility for Traineeship, the University of Milan usually publishes two calls a year enabling students to choose a destination defined by an inter-institutional agreement or to find a traineeship position on their own.
The University organizes informative meetings to illustrate mobility opportunities and rules for participation.

Erasmus+ scholarship
The European Union grants the winners of the Erasmus+ programme selection a scholarship to contribute to their mobility costs, which may be supplemented by the University funding for disadvantaged students.

Language courses
Students who pass the selections for mobility programmes can benefit from intensive foreign language courses offered each year by the University Language Centre (SLAM).
https://www.unimi.it/en/node/8/
Learn more at https://www.unimi.it/en/node/274/
For assistance, please contact:
International Mobility Office
Via Santa Sofia 9 (second floor)
Tel. 02 503 13501-12589-13495-13502
Contacts: InformaStudenti; mobility.out@unimi.it
Student Desk booking through InformaStudenti

1st COURSE YEAR Core/compulsory courses/activities common

Learning activity	Ects	Sector
Agricultural policy and rural appraisal	12	AGR/01
Data analysis for agriculture	6	AGR/17
English proficiency B2 (3 ECTS)	3	NN
Farm irrigation	8	AGR/08
Mechanization and technologies for agriculture	8	AGR/09
Sustainable cropping systems	12	AGR/02
Sustainable livestock systems	8	(4) AGR/19, (4) AGR/18
Total compulsory credits	57	

2nd COURSE YEAR Elective courses

Courses within a specialization track
The student can choose one of the three pre-approved specialization tracks. Any deviations from the proposed plans of study will be evaluated by the Collegio didattico.

Farm management track
5 courses chosen from the following:

Agri-food Marketing	6	AGR/01
Economics of agricultural markets	6	AGR/01
Economics of innovation	6	AGR/01
Energy for Agriculture	6	AGR/09
Landscape planning	6	AGR/10
Management of crop disease and pest	6	(3) AGR/11, (3) AGR/12
Technical standards and best practice in agriculture	6	(2) AGR/08, (2) AGR/09, (2) AGR/10

Animal systems track
5 courses chosen from the following:

Animal genetics and biotechnology	6	AGR/17
Livestock structures and sustainable waste managementf	6	AGR/10
Mechanization of livestock production	6	AGR/09
Precision livestock farming	6	AGR/19
Precision livestock feeding	6	AGR/18
Quality of animal products	6	AGR/19
Sustainable feed production	6	AGR/18

Precision Agriculture track:
5 courses chosen from the following

Laboratory of precision agronomy	6	AGR/02
Laboratory of precision irrigation	6	AGR/08
Management of spatial variability and GIS for precision agriculture	6	(5) AGR/08, (1) AGR/02
Precision agriculture equipment and field application	6	AGR/09
Precision crop protection	6	AGR/12
Remote sensing for agriculture	6	ICAR/06
Smart technologies for precision livestock	6	AGR/10

The academic plan includes 9 elective credits. These have to be earned through one course to be selected among those organised for this degree programme – including courses of the specialization track chosen – or for other programmes of this Faculty and the University, and through other educational activities that can be measured in credits. Students are invited to visit the website of the Faculty of Agricultural and Food Sciences to check the list of courses and their actual availability. Educational activities for which students can obtain credits – usually up to 5 credits – include seminars, conferences, refresher courses and other activities organised by this University or another entity, provided that they are congruent with the study programme. The award of credits for this kind of activities must be agreed beforehand with the professor acting as tutor. Such activities also include Research-Enriched Education (REE) laboratories (3 credits), which are organised by the Department of Agricultural and Environmental Sciences on a yearly basis. The goal of REE laboratories is to develop a cultural approach to teaching where professors play a role in the teaching innovation process – which is centred on students and the use of new technologies – by experimenting with innovative courses that integrate education and research. REE laboratories consists on average of 6 days of exercises and applied laboratory or field work (for example at one of the teaching/experimental farms of the University of Milan) under the supervision of professors and technical staff, with a brief methodological introduction to the scheduled activities. During REE laboratories, reference may be made to background knowledge covered by courses that students have already attended or are going to attend afterwards. See also the paragraph Structure of the course - Presentation of the study plan.

	6	AGR/10
	11	(7) ICAR/15, (4) AGR/04
Animal reproduction and herd health	4	VET/01
Environmental impact of agro-food production systems	4	AGR/19, AGR/09
International cooperation and crop-livestock systems	6	AGR/18
Multimedia communication laboratory in agriculture	4	AGR/19, AGR/03
Ree RuMeN - Precision Feeding for the Environment: Rumen, Methane, and Nutrition	3	AGR/18
Ree Smartcow - Precision dairy farming	3	AGR/19
Soil bioengineering	6	AGR/08

End of course requirements

Final exam		24	NN
	Total compulsory credits	24	